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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,269	05/11/2001	Thomas H. DiStefano	TESSERA 3.0-139 DIV	8467

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EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 05/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/854,269

Applicant(s)

DISTEFANO, THOMAS H.

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the application filed May 11, 2001.

Drawings

2 The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 326 (See Page 21 Paragraph 44). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3 The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: a) 36' (See Figure 5); b) 230 (See Figure 11); c) 256 (See Figure 12); d) 329 (See Figure 13); and e) 336 (See Figure 13). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 4-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear what is meant by the following: a) "solder masses at at least some of said pairs" (See Claim 4). Claims 5-7 depend directly or indirectly from a rejected claim and are, therefore, also rejected under 35 U.S.C. 112, second paragraph for the reasons set above.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Lakritz et al. (U.S. Patent No. 4,545,610).

In regards to claim 1, Lakritz et al. ("Lakritz") discloses the following:

a) a microelectronic element (20) having a front surface with contact pads (21) thereon (See Figure 2);

b) elongated solder columns (38) extending from said front surface of said microelectronic element, said columns having distal ends remote from said microelectronic element (See Figure 2); and

c) terminals (12) connected to said distal ends of said solder columns (See Figure 2).

In regards to claim 4, Lakritz discloses the following:

a) first and second elements (10 and 20) having confronting surfaces, pads (12 and 21) on said confronting element arranged in pairs, each such pair including a pad on the first element and a pad on the second element (See Figure 2);

b) solder mass (38) being associated with the pads of one said pair and extending therebetween, said solder masses incorporating columnar inclusions therein (See Figure 2); and

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c) columnar inclusions within at one of said solder masses being oriented preferentially in the direction between the pads of the associated pair (See Figure 2).

In regards to claim 5, Lakritz discloses the following:

a) solder mass is elongated in the direction between the pads of the associated pair (See Figure 2).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lakritz et al. (U.S. Patent No. 4,545,610) in view of Hoffman et al. (U.S. Patent No. 5,578,869).

In regards to claim 2, Lakritz fails to disclose the following:

a) a dielectric packaging structure overlying said front surface of said microelectronic element, said dielectric packaging structure having an interior surface facing toward said microelectronic element and an exterior surface facing away from said microelectronic element, said packaging structure having pads connected to said distal ends of said solder columns and having said terminals thereon connected to the pads of the packaging structure.

However, Hoffman et al. ("Hoffman") discloses a dielectric layer (See Column 6 Lines 60-63). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Lakritz to include a dielectric layer as disclosed in Hoffman because it aids in insulating layers from shortening out.

In regards to claim 3, Lakritz fails to disclose the following:

a) a compliant layer surrounding said solder columns, and wherein said packaging structure is a flexible sheetlike element.

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However, Hoffman discloses a compliant layer (See Column 7 Lines 6-11). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Lakritz to include a compliant layer as disclosed in Hoffman because it aids in increasing the reliability of the solder.

11. Claim 6 and 7, as far as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lakritz et al. (U.S. Patent No. 4,545,610) in view of Garner (U.S. Patent No. 4,581,680).

In regards to claim 6, Lakritz discloses the following:

a) the pads of each said pair are spaced apart from one another in a vertical direction normal to the confronting surfaces and offset from one another in a horizontal direction parallel to the confronting surfaces (See Figure 2);

In regards to claim 6, Lakritz fails to disclose the following:

a) elongated solder masses extend oblique to said vertical and horizontal directions.

However, Garner discloses solder masses extended in an oblique direction (See Figure 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Lakritz to include solder masses extended in an oblique direction as disclosed in Garner because it aids in reducing stress on the pads.

In regards to claim 7, Lakritz fails to disclose the following:

a) solder masses consist essentially of a lead-tin solder with between about 1% and about 5% copper, and wherein said columnar inclusions constitute a copper-rich phase within said solder masses.

However, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are

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disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235.


Conclusion

12. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: a) Hahn et al. (U.S. Patent No. 5,499,312) discloses packaging using flip chip technology; and b) Yamashita (U.S. Patent No. 5,509,203) discloses a method for manufacturing a sheet.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 703-308-4940. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML
May 2, 2002


CARL WHITEHEAD, JR.
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